ANALYTICAL CHEMISTRY SULFITE DETERMINATION USING EDIBLE ANTHOCYANINS: A GUIDED-INQUIRY BASED LABORATORY

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Abstract

Natural plant pigments, such as anthocyanins, present in fruits and vegetables, are attracting public interest as an important group of dietary antioxidants. Capitalizing on this interest, this activity allows the students to explore the chemistry of these anthocyanins as it relates to changes in pH, the Beer-Lambert Law and sulfite bleaching experiments. The experiment is designed as a guided-inquiry exercise using juices from both bottled and fresh sources available at any grocery store. Students create a stock solution from a fruit or vegetable of their choice and document the changes that occur in the visible spectrum as the stock solution is place in buffered solutions ranging from pH 7-10. After determining an appropriate pH to conduct the experiment, the anthocyanin solution is treated with solutions of known sulfite concentration (buffered to the appropriate pH). The ensuing redox reaction causes a decrease in the absorbance at the max. The linear response of the anthocyanin solution's absorbance as a function of the sulfite concentration is examined using the Beer-Lambert Law. As a final step, the students can analyze an unknown solution for sulfite concentration.

Category

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